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RESEARCH ARTICLE

The memory-impairing effects of simulated amnesia for a mock crime

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Summary

The present study examined whether mock offenders, who were instructed to falsely deny crime details or to simulate amnesia, would consequently experience impaired memory. Ninety-three university students were first asked to commit a mock crime and were then assigned to three different conditions (i.e., false denial, simulated amnesia, and truth telling) and then received the first memory test. The following day, participants completed a second memory test. Results showed that the memory impairment was not observed in participants in the false denial condition. However, in the simulated amnesia group, memory about being interviewed in the first session was impaired. The simulated amnesia group also had lower recollection and belief ratings in the occurrence of true details for the mock event. Findings suggest that after simulating amnesia, offenders can forget details related to the interview and exhibit diminished ratings for the recollection of and belief in their memory for experienced events.

KEYWORDS

denial, denial-induced forgetting, memory, offenders, simulated amnesia

1 | INTRODUCTION

In criminal cases, it is not uncommon for offenders to use different coping strategies in order to minimize culpability or to escape conviction all together. Offenders sometimes (falsely) deny or simulate memory loss for their criminal involvement (Cima, Merckelbach, Nijman, Knauer, & Hollnack, 2002; Henning, Jones, & Holdford, 2005). A good example is that of sex offenders who are sometimes known to use denial (Barbaree, 1991; Marshall & Barbaree, 1990; Marshall & Eccles, 1991) and other forms of cognitive distortions (e.g., minimization; Langevin, 1988) as a form of defense (Rogers & Dickey, 1991); however, the purpose differs somewhat. For instance, sex offenders sometimes deny that their behavior had a harmful effect on victims (i.e., denial of victim impact; Happel & Auffrey, 1995). Another way that sex offenders try to escape legal responsibility is to claim that they

have no recollection of actually committing the act (e.g., "I was intoxicated"; Marshall, Serran, Marshall, & Fernandez, 2005). However, it has been argued that in such cases, these claims of amnesia are perhaps not authentic but are instead fabricated (Marshall et al., 2005).

Eventually, some offenders come forward with what purportedly happened. A crucial issue is the extent to which the use of cognitive strategies (e.g., denial and simulated amnesia) can affect the memory performance of offenders after some time has elapsed. This is the impetus of the current experiment.

2 | DENIALS AND MEMORY

Research has shown that the false denial of information can have a negative impact on people's confidence and memory accuracy for

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personal experiences (Davis et al., 2018; Otgaar, Howe, Smeets, & Wang, 2016; Otgaar, Romeo, Howe, & Ramakers, 2018; Otgaar, Scoboria, & Mazzoni, 2014). These results arguably have practical implications for the way in which we understand and approach societal problems that people may respond to by employing coping strategies (e.g., child sexual abuse). Indeed, victims of child sexual abuse are known to deny the occurrence of the abuse (Bussey, 1995).

Victims do this in order to cope with adverse emotional and psychological symptoms, and as such, disclosure of the abuse is sometimes delayed (Jonzon & Lindblad, 2004; London, Bruck, Ceci, & Shuman, 2005). In one of the first demonstrations of the effect of denying information on memory, Vieira and Lane (2013) instructed participants to study several presented pictures (e.g., an apple). Next, participants had to tell the truth or deny (i.e., lie) about having seen the pictures (old and new items) by way of denial or fabrication. After a 48-hr delay, participants completed a source memory test that included both the old and new pictures and examined their memory for the lies that they told in Session 1. Results showed that in comparison with fabricated lies, participants' memory was poorer for lies that involved the denial of items they had actually seen.

In another line of research, Otgaar and colleagues (Otgaar & Baker, 2018; Otgaar, Howe, et al., 2016; Otgaar, Howe, Memon, & Wang, 2014) found that false denials can affect memory. In the 2014 study, participants (children and adults) viewed a video of a theft. Participants were randomly allocated to three conditions (i.e., cued recall, forced confabulation, and false denial). In Session 1, participants in the false denial condition were instructed to deny in response to every question. One day later, all participants received a second memory test and were instructed to respond truthfully to all questions. Specifically, during this memory test, participants received two memory-related questions. The first one concerned memory of what had been discussed, whereas the second question referred to memory of the video. Of main interest to the current experiment is that Otgaar et al. (Otgaar, Howe, et al., 2014) found that using a cognitive strategy such as false denial led to memory impairment for the discussion of details with the experimenter.

This denial induced-forgetting (DIF) effect was subsequently replicated using different stimuli (i.e., negative and neutral pictures; Otgaar et al., 2016) and by testing recall accuracy (Otgaar et al., 2018). What these experiments have in common is that memory of details that were seen and subsequently discussed, as opposed to those merely seen and not discussed, was undermined. Note, however, that another common ground in these studies is that they all examined DIF from an eyewitness perspective. As such, the first aim of the present experiment is to find out whether DIF can also be experienced by offenders. Secondly, we investigated whether forgetting can occur as a result of another cognitive strategy that is believed to yield memory-undermining effects: simulating amnesia for an offense.

3 | SIMULATING AMNESIA AND MEMORY

The number of studies that focus directly on factors related to offender memory is quite limited. Nevertheless, there is some exploratory information about causal factors. Again, we refer to the example

of sex offenders who sometimes report that they have no recollection of actually committing the act, and they give different reasons for this (e.g., blackouts, head injury, and intoxication; Marshall et al., 2005). However, it is likely that this "amnesia" is often fabricated and not a case of authentic amnesia (Marshall et al., 2005). The primary conundrum here is what effect-simulated amnesia has on memory when an offender does decide to provide an honest account.

Research has shown that simulating amnesia undermines memory for later accounts (Bylin & Christianson, 2002; Christianson & Bylin, 1999; Mangiulli, van Oorsouw, Curci, Merckelbach, & Jelicic, 2018; Newton & Hobbs, 2015; Van Oorsouw & Merckelbach, 2004; Van Oorsouw & Merckelbach, 2006). Christianson and Bylin (1999) asked participants to read a description of a crime and act as though they were the main perpetrator. Participants in the *genuine group* had to recall as many details as possible, and the *simulation group* had to pretend to forget details. After 1 week, participants were reassessed, and recall accuracy in the simulation group was found to be poorer in comparison with the genuine group. Other research also found that simulators of amnesia had significantly worse free-recall memory in comparison with an honest group of participants for details of a mock crime they had committed (Van Oorsouw & Merckelbach, 2004; Van Oorsouw & Merckelbach, 2006). The proposed mechanism behind the memory-undermining effects of simulating amnesia is that simulating amnesia obstructs the rehearsal and encoding of information in long-term memory, thereby resulting in memory impairment (Christianson & Bylin, 1999; McWilliams, Goodman, Lyons, Newton, & Avila-Mora, 2014; Sun, Punjabi, Greenberg, & Seamon, 2009; Van Oorsouw & Merckelbach, 2004).

4 | LYING AND MEMORY

A recently proposed framework (i.e., memory and deception [MAD] framework; Otgaar & Baker, 2018) provides some understanding of the mechanisms underlying the effects of false denial and simulated amnesia on memory. It posits that for different types of deception, varying amounts of cognitive resources are harnessed. For example, a false denial such as "No, I did not search the professor's bag" may require fewer cognitive resources and be less cognitively demanding than an elaborate simulated amnesia response where someone claims to have forgotten and adds fabricated details. In general, based on the MAD theory, the idea is that engaging in any type of lie (e.g., such as false denials or simulated amnesia) is more cognitively demanding than telling the truth and as such the idea that it might leave fewer cognitive resources available for the rehearsal of information. The storage of information into memory is facilitated by rehearsal. Therefore, when people lie, the storage of information is compromised because the correct information is neither attended to nor rehearsed, and false information might become reinforced. In turn, the inadequate rehearsal of true information can result in the omission of correct details later on during memory retrieval. Furthermore, if the simulation of amnesia results in greater cognitive exertion than false denial, then in theory, the rehearsal process may also be affected more adversely. This is in line with tenets of the *cognitive approach* to lie detection that has been studied in the field of deception research. The fundamental

argument is that lying is strenuous and requires more cognitive resources than truth telling (DePaulo et al., 2003; Suchotzki, Crombez, Smulders, Meijer, & Verschuere, 2015; Vrij, 2006; Vrij & Fisher, 2016), and this can be exploited to more effectively distinguish liars from truth tellers (Vrij et al., 2008; Vrij, Granhag, Mann, & Leal, 2010). The MAD framework adds to this by postulating that depending on the type of lie and even perhaps the amount of consumed cognitive resources, memory can be affected in different ways (e.g., false memory and omission).

Relatedly, the memory impairment that is associated with simulated amnesia has been attributed to retrieval-induced forgetting (Anderson, Bjork, & Bjork, 1994; Mangiulli et al., 2018). In order to simulate amnesia, the selective retrieval of information is necessary in order for the memory of correct information to be inhibited (Anderson et al., 1994; van Oorsouw & Merckelbach, 2004). Arguably, such selectivity would warrant a considerable level of focus and cognitive effort.

The current experiment examined the memory effects of false denials and simulated amnesia in a sample of mock offenders. Specifically, memory for the discussion with the interviewer, the actual event, and recollections of and beliefs pertaining to aspects of the event were examined. Participants were randomly assigned to three conditions (i.e., false denial, simulated amnesia, and truth telling) and received condition-specific interview questions over two sessions. We hypothesized that those participants instructed to falsely deny or simulate amnesia for details of the mock crime, would perform worse than (truth telling) controls in a 24-hr delayed memory test. Additionally, for exploratory reasons, we also measured participants' belief and memory ratings of their recollections (Otgaar, Scoboria, & Mazzoni, 2014).

5 | METHOD

5.1 | Participants

Using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007), an a priori power analysis with a power of 0.80 and medium to high effect size ($f = 0.33$) indicated a sample of 93 participants was required. Ninety-three undergraduate students (78 females) from different universities in the Netherlands were tested. Their mean age was 21.92 years ($SD = 2.30$; range 18–29 years). Compensation for Sessions 1 and 2 consisted of university credits or a voucher worth €7.50. The ethical committee of the Faculty of Psychology and Neuroscience of Maastricht University granted ethical permission (reference number: ECP 158_02_11_2015). Data for the study can be accessed on the Open Science Framework: <https://osf.io/tz3jx/>

5.2 | Materials, design, and procedure

The experiment used a between-subjects design, and participants were randomly assigned to the false denial ($n = 31$), simulated amnesia ($n = 31$), or truth telling/control conditions ($n = 31$). Participants were recruited from Maastricht University and other universities in the Netherlands via posters and advertisements on social media. After

the mock crime was committed, participants were informed that they would be interviewed about the event. The study was divided into two sessions. In Session 1, participants committed the mock crime after which the first memory test was administered.

5.2.1 | Mock crime

Participants received a note with a set of instructions. The note stated that there was a statistics exam scheduled to occur in 1 week and that many students found the exam to be very difficult. Participants were told that it would be in their best interest to have the answers to the exam beforehand. To access the answers, they had to gain access to the statistics professor's email using a password. They were instructed to take a pen (to write down the password) and go to the professor's lab where the password could be found. The password was then used on a computer in an adjacent room to gain access to the professor's email account. Answers to the exam were to be found in the professor's email and participants had to forward the email containing the answers to a certain email address before logging out and returning to the main experimental room.

5.2.2 | Session 1 and condition assignment

Directly after the mock crime, a first memory test was administered as an interview and it consisted of nine questions (e.g., "Did you enter the next room afterwards?"). This memory test was formatted as a structured interview and was used to assess participants' memories for the mock crime. Two of the nine questions contained false detail information about events that did not occur and were unrelated to what the participants had to do in the mock crime (e.g., "Did you steal a key?", see Appendix A). A priori to their participation, participants were randomly assigned to one of three conditions, and as a result, participants received instructions that differed between the three conditions. Truth tellers were instructed to tell the truth in response to all of the questions, the false deniers had to deny the facts for all the questions (e.g., "No, I did not search the professor's bag"), and the amnesia simulators were instructed to simulate memory loss for the mock crime (e.g., "My memory is vague; I cannot remember searching the bag"). Similar to Van Oorsouw and Giesbrecht (2008), for this task, participants in the simulated amnesia condition were told that they could avoid punishment by simulating memory loss for the mock crime (see Appendix A) and that simply saying they could not remember anything was not sufficient. Therefore, they had to make a concerted effort to convince the interviewer of their memory loss. Responses for all of the conditions were coded as "yes" (i.e., when the participant admitted details), "no" (i.e., when the participants denied details), or "I don't know" (i.e., when the participant simulated memory loss for details). See Appendix B for the specific instructions.

5.2.3 | Session 2

The second memory test was completed 24 hr after the mock crime and measured memory for the interview with the experimenter (e.g., "When I talked to you yesterday, did we talk about whether you stole the e-mail password of the professor?") and measured memory for the

mock crime (e.g., “Did you steal the e-mail password of the professor?”).

The second memory test contained all nine items (seven true detail and two false detail questions) from the first memory test, along with two false detail filler items. Each item had four questions. The first two questions for each item pertained to specific event details, and participants were instructed to answer truthfully to all questions in either a “yes/no” manner. The first question probed for whether certain information was discussed with the interviewer (see above). The second question was related to the participants' actual memory for the event (see above). The last two questions for each item were exploratory in nature and were rated on an eight-point Likert scale. They examined participants' beliefs (e.g., “To what extent is it possible that you searched the bag?”) and recollections for the event (e.g., “Do you actually remember searching the bag?”; see Appendix C). Ratings were completed on an eight-point Likert scale for beliefs (that is, 1 [*definitely did not happen*] to 8 [*definitely did happen*]) and recollection (that is, 1 [*definitely no memory at all*] to 8 [*very clear memory*]; Scoboria, Mazzoni, Kirsch, & Relyea, 2004). Correct memories for the mock event were identified by consistency in responses to the nine original questions from the first interview.

6 | RESULTS

6.1 | Memory for the interview

Our first analyses focused on whether we could detect a DIF effect. Data from the second memory test are shown in Table 1. A one-way analysis of variance (ANOVA) showed that for correctly recalled true items, there was a statistically significant main effect, $F(2, 90) = 3.40$, $p = 0.04$, $\eta_p^2 = 0.07$, and such an effect was also found for presented false items that were answered correctly, $F(2,$

$90) = 6.80$, $p < 0.01$, $\eta_p^2 = 0.13$. Post hoc Bonferroni-corrected comparisons showed that in contrast to the truth telling/control condition ($M = 6.55$, CI [6.28, 6.81] for true items and $M = 1.39$, 95% CI [1.11, 1.67] for false items), participants in the simulated amnesia condition were statistically significantly more likely to deny having talked about both true items ($M = 5.97$, 95% CI [5.58, 6.35]; $p = 0.04$) and false items from the first interview ($M = 0.65$, 95% CI [0.35, 0.94]; $p < 0.01$). Other comparisons (i.e., false denial condition versus truth telling/control) were not statistically significant (all $ps > 0.05$). These effects show the simulated amnesia group evinced a forgetting effect that has been found in previous studies on the effects of false denials on memory (i.e., DIF).

6.2 | Memory for the mock crime

A Kruskal–Wallis nonparametric test analysis was used because of violations of homogeneity. This analysis indicated no statistically significant effects between the conditions for memory of true items, $H(2) = 4.97$, $p = 0.08$, and false items, $H(2) = 2.93$, $p = 0.23$.

An alternative way to examine whether false denials or simulating amnesia might have affected memory for the mock crime is to look at the recollection ratings as a function of the conditions. A one-way ANOVA was conducted for recollection ratings, and we found a statistically significant condition effect— $F(2, 90) = 5.98$, $p < 0.01$, $\eta_p^2 = 0.12$. Post hoc Bonferroni-corrected comparisons showed a statistically significant difference between the groups for recollection ratings. Participants in the simulated amnesia group had the lowest recollection ratings ($M = 7.70$, CI [7.51, 7.88]) when compared with the false denial ($M = 7.97$, CI [7.90, 8.03]) and truth telling groups ($M = 7.93$, CI [7.85, 8.01]). Due to violations of the assumption of homogeneity of variance, a Kruskal–Wallis nonparametric test was also conducted, and the analysis showed a statistically significant condition effect for the

TABLE 1 Mean number of correctly recalled items (out of a maximum of 7 for true items and 2 for false items) and belief and recollection ratings for the three conditions separately

Condition	Simulated amnesia			False denial			Truth telling		
	Mean	SD	%	Mean	SD	%	Mean	SD	%
Memory for the interview									
True items	5.97	1.05	85.29	6.42	0.96	91.71	6.55	0.72	93.57
False items	0.65	0.80	32.5	1.00	0.82	50	1.39	0.76	69.50
Memory for the mock event									
True items	6.81	0.48	97.28	6.97	0.18	99.57	6.97	0.18	99.57
False items	2.00	0.00	100	1.94	0.25	97	1.90	0.30	95
Recollection ratings									
True items	7.70	0.50	—	7.97	0.18	—	7.93	0.22	—
False items	1.19	0.57	—	1.26	0.88	—	1.26	0.87	—
Belief ratings									
True items	7.70	0.45	—	7.92	0.25	—	7.89	0.23	—
False items	1.55	1.04	—	1.56	1.35	—	1.45	1.07	—
Believed memories	6.48	1.23	—	7.13	0.72	—	7.03	0.91	—

Note. These results are from the memory test in Session 2. The first two main rows pertain to memory of the interview and memory of the mock crime. Percentages for these row are indicative of accuracy. Exploratory information that was rated on an eight-point Likert scale is contained in the third and fourth main rows. Percentages for these rows are indicative of belief and accuracy. The last row pertains to events that received equally high recollection and belief ratings (score of 7 or 8 on the Likert scale). Mean results were out of a maximum of 7 for true items and 2 for false items.

recollection ratings of true events, $H(2) = 17.48$, $p < 0.01$, with the simulated amnesia condition having the lowest mean score. A one-way ANOVA analysis did not show a statistically significant difference for recollection ratings for false items or filler items ($ps > 0.05$).

7 | EXPLORATORY ANALYSES

We also explored participants' belief ratings and believed memories concerning presented and nonpresented items in the mock crime. A one-way ANOVA was conducted for belief ratings, and we found a statistically significant condition effect— $F(2, 90) = 4.37$, $p = 0.02$, $\eta p^2 = 0.09$). Post hoc Bonferroni-corrected comparisons showed a statistically significant difference between the groups for belief ratings. Participants in the simulated amnesia group had the lowest belief ratings ($M = 7.70$, CI [7.53, 7.86]) for true details from the mock crime when compared with the false denial ($M = 7.92$, CI [7.82, 8.01]) and truth telling groups ($M = 7.89$, CI [7.81, 7.98]). Due to violations of the assumption of homogeneity of variance, a Kruskal–Wallis nonparametric test analysis was also conducted, and a statistically significant condition effect was found for belief ratings for true details— $H(2) = 8.05$, $p = 0.02$ —with a mean rank of 38 for the simulated amnesia, 52 for false denial, and 50 for truth telling. The result indicates that the simulated amnesia group believed less in the occurrence of the events than the other groups. The assumption of homogeneity of variance was not violated for the mean total belief ratings for false details and filler details. A one-way ANOVA did not show a statistically significant condition effect for belief ratings for false details ($p > 0.05$).

Questions that received a high rating for both recollection and belief (i.e., 7 or 8 on the eight-point Likert scale) constituted as believed memories. Kruskal–Wallis nonparametric test analysis results showed that for believed memories— $H(2) = 5.85$, $p = 0.05$ —the simulated amnesia condition had the lowest mean rank of 38 in comparison with mean ranks of 50 for the control condition and 52 for the false denial condition.

8 | DISCUSSION

The principal goal of the current experiment was to investigate the memory effects of false denials and simulated amnesia for a mock crime. Previous research has shown that memory accuracy for the occurrence of lies that were told is poorer when people are instructed to falsely deny different aspects of an experience (Vieira & Lane, 2013). Research has also revealed that the remembrance of discussion about details during an interview can be impaired, when those details were initially falsely denied (i.e., DIF; Otgaar, Howe, et al., 2014; Otgaar, Scoboria, et al., 2016; Otgaar et al., 2018).

In previous DIF studies by Otgaar and colleagues (Otgaar & Baker, 2018; Otgaar, Howe, et al., 2014; Otgaar, Howe, et al., 2016), participants were exposed to stimuli such as pictures and videos; however, the question begs to be asked if these effects would still manifest under more physically demanding conditions. In fact, this issue has recently been addressed in a study where participants were immersed in a virtual reality (VR) environment and saw a realistic scene of a plane crash site. In line with previous work that examined the effects

of lying on memory, results showed a forgetting effect for the discussion of details during the interview and details from the actual VR scene, in participants who were directed to falsely deny details (Romeo, Otgaar, Boerboom, Landström, & Smeets, 2018).

At odds with previous findings (e.g., Otgaar, Howe, et al., 2016), we did not find evidence for DIF for participants that were instructed to falsely deny in the current study. What could be the reason for these findings? Previous research on DIF differed in many respects from the current experiment. For example, previous research focused on false denials from a more victim/eyewitness perspective whereas the current experiment concentrated on the perspective of a perpetrator. Perhaps in the case of people who are acting in the role of a perpetrator, false denials only have a memory-impairing effect when it is done under the added cognitive strain of interacting significantly within an environment. If performing an action as opposed to being a passive observer and physical immersion possibly mitigated the memory effects of false denial, this may mean that there are contextual differences in the way that different cognitive strategies. That is, false denial may be less effective in impairing memory for experiences in which people are active participants (e.g., someone committing a crime). So, our experiment suggests that there may be a boundary to the DIF effect in that the effect disappears when people are actively involved in an event and then have to falsely deny having experienced certain details. Of course, future studies should try to replicate this by experimentally examining the memory performance of both mock offenders and victims who falsely deny information for the same mock crime.

Our results dovetail nicely with research showing that memory for self-performed actions is superior to memory for witnessed events (e.g., Zimmer & Engelkamp, 1999). This action superiority effect might have occurred here as well because participants had to act as an offender and were engaged in several crime-related actions (e.g., stealing password). According to the MAD framework (Otgaar & Baker, 2018), memory-undermining effects of deception will likely only occur if the act of deception (e.g., false denial or simulating amnesia) consumes enough cognitive resources to interfere with the ability to rehearse information. Because participants remembered their “offense” quite well, the act of a simple denial might not be sufficient to inhibit rehearsal and produce memory undermining effects. Simulating amnesia is assumed to use more cognitive resources than denial. It was emphasized to participants in the simulated amnesia group that in addition to saying that they could not remember, they should also consciously exert effort to feign memory loss (see Appendix B), so this might explain why we only found observed a forgetting effect in simulators.

Another possible explanation for the failure to replicate DIF in the false denial condition could simply be due to the type of stimuli used in the study. Pictures were used in some still studies (i.e., Otgaar, Howe, et al., 2016; Vieira & Lane, 2013), whereas others included video (Otgaar, Howe, et al., 2014; Otgaar et al., 2018). Participants in this study were instructed to write, move between rooms, and operate a laptop, which arguably required them to be more cognitively stimulated. It is known that arousal can heighten attention to environmental details (Storbeck & Clore, 2008). Therefore, engaging in a more physically and perceptually demanding task such as a mock crime may have increased the focus of participants, making it more difficult to forget details.

We did find a forgetting effect in the simulating amnesia condition. Because simulating amnesia requires denial to some extent, an adverse effect on memory was anticipated and ultimately supported by the findings. The observed forgetting effect in the simulated amnesia is not completely novel because other research that examined the effects of simulating amnesia for committed offences has also demonstrated that it produces memory-undermining effects (e.g., Christianson & Bylin, 1999; Mangiulli et al., 2018; Sun et al., 2009; Van Oorsouw & Merckelbach, 2004). Although our procedure is a far stretch from how offenders commit crimes in real life, the fact that participants adopted a stance that is similar to real offenders, our findings can in the least act as an inspiratory point for thoughts about how real offenders may be affected.

Analyses showed that the simulated amnesia condition had comparatively lowers belief ratings than the false denial and truth telling conditions. This is somewhat consistent with the propositions made by the MAD framework (Otgaar & Baker, 2018). Because fabricating events increases belief that those events occurred (Polage, 2012), perhaps it is possible that simulating amnesia decreases the belief that the event happened. This parallels research showing that people reduce the belief in the occurrence of experienced events when their memories are challenged. For example, Mazzoni, Clark, and Nash (Mazzoni, 2014) found that misleading participants by telling them that they did not perform actions that they had in fact performed reduced subsequent belief ratings for those actions (also see for related work Otgaar, Howe, et al., 2016). However, this research shows that external pressure can affect the belief that people have in experiences. In the current experiment, participants challenged their own memories by, for example, simulating amnesia. Future research might examine whether internal or external challenges on one's experiences are equally likely to affect the belief in occurrence of those experiences. Because in real life, most offenders are not immediately interviewed after a crime is committed, it is also worth exploring how DIF presents after longer time intervals.

The results supported the idea that forgetting can in fact be induced in perpetrators of (mock) crimes. We also found that simulated amnesia resulted in lower belief ratings in comparison with when false denial or no strategy was used. It has been reported that a substantial portion of defendants claims memory loss for the offence they are accused of (Cima et al., 2002; Kopelman, 1995). These findings bring both therapeutic and legal implications to mind. For example, due to the very taboo nature of the act, people who commit sexual offences are known to use cognitive strategies (Rogers & Dickey, 1991) such as false denial to cope and/or absolve themselves of wrongdoing (Marshall et al., 2005). Sex offenders' ability and readiness to overcome denial is considered to be a key component in their treatment (West Midlands Probation Service, 1996), and fragmented memories or reduction in belief of the criminal event may affect the therapeutic process (Marshall, 1994; Schneider & Wright, 2004). As for a legal impact, if a defendant's memory or belief for an event is altered, they may not be able to give an accurate statement. The account of a defendant who is in denial for an offence and who is repeatedly interviewed may change over time, casting additional doubts on their credibility (Malloy, Lamb, & Cutler, 2010).

9 | LIMITATIONS

The factors (e.g., emotions) that are present in the experience of a mock crime versus a real crime will naturally differ in some ways. However, this study was designed in a manner that closely reflects some aspects of the experience of a real crime (e.g., deception). Nevertheless, the findings of our experiment may not necessarily be generalizable to real offenders, and this underscores the constraints of generality of laboratory experiments (Simons, Shoda, & Lindsay, 2017).

It is possible that our observed memory effect was the result of demand characteristics, a matter that has been acknowledged in previous studies that examined the effects of denial on memory. For example, in the study by Otgaar, Howe, Smeets, and Wang (Otgaar, Howe, et al., 2016), the authors noted the possibility of participants' continued compliance with instructions that were given in the first session. However, in a study that used a methodology that differed only slightly from the current experiment (i.e., a second experimenter in the second session to reduce compliance; Otgaar, Howe, et al., 2014; Otgaar, Scoboria, & Mazzoni, 2014) to examine DIF, the effect still emerged. Although demand characteristics cannot be completely ruled out, it is unlikely to have been an influential factor in the current experiment.

10 | CONCLUSION

In conclusion, our findings suggest a boundary effect to DIF and a genuine adverse memory effect to simulated amnesia from the perspective of a person who is acting in the role of an offender. We found that forgetting about the occurrence of discussions about critical aspects of their experiences can occur in offenders who simulate amnesia for a mock crime. A forgetting effect that in essence is akin to that of DIF was found in participants that were instructed to simulate amnesia. Specifically, simulators were less likely to remember that they talked with the experimenter about certain details of the mock crime than the other participants. Additionally, in contrast to the other groups, simulators had lower recollection and belief ratings for the occurrence of true events from the mock crime. The findings herein illustrate that even when someone commits a crime, they can forget that they discussed details of the event if they simulate amnesia with the motivation to diminish responsibility and reduce the believability of their own memories.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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